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OLD AND NEW WORLD SPIDERS

Descriptions of Several European and North-African Spiders. By T. Thorell. Kongl. Svenska Vetenskaps. Akademiens Handlingar, Bandet 13, n. o. 5, pp. 1—203. (Stockholm : Norstedt and Söner, 1875.)

A Collection of the Arachnological Writings of Nicolas Marcellus Hentz, M.D. Edited by Edward Burgess. With Notes and Descriptions by James H. Emerton. Forming No. II. of Occasional Papers of the Boston Society of Natural History, pp. 1—171, Pl. 1—21. (Boston: U.S.A., 1875.)

IT is a somewhat singular coincidence that the two works at the head of this article should have been published just about the same time. We shall endeavour briefly to show the value and bearing of each.

It is probably undeniable that an illustrated book on any branch of natural history is more acceptable to the public—certainly more attractive—than one wholly devoid of pictorial illustrations ; and not without good reason, for it is well known what great assistance even the advanced student obtains from a single glance at an illustration, when traced by a hand well cognisant of the point sought to be illustrated, even though the hand may be entirely wanting in artistic power. The want, however, of drawings to assist the comprehension of the dry details of natural objects may be reduced to a minimum by the presence of good diagnoses. Pleasant are those pages where both these helps exist ; dreary and uninviting indeed (though sometimes inevitable) are long and dry details of form, structure, and colour, when unenlivened either by drawings or diagnoses. From such dreariness Dr. Thorell's two hundred quarto pages of descriptions of spiders (under the title given at the head of this notice) are saved by the excellent diagnosis with which each description is preceded. It not unfrequently happens that a diagnosis is a mere formal abstract of the longer description that succeeds it ; this is, however, not the case in the present instance, where each diagnosis puts before us just such distinctive points of special form, structure, and colour as the describer, were he at all able with his pencil, would endeavour to delineate by means of rapid sketches and dissectional drawings.

In respect to this point Dr. Thorell remarks (p. 4), that he has "prefaced his descriptions with *diagnoses*, although this is not done by the generality of modern arachnologists," it is, he says, "my firm conviction that tolerably good diagnoses very greatly facilitate the determination of unknown species, even though they be not real [by the term *real* Dr. Thorell appears to mean *full*] definitions." This places a diagnosis, in relation to the full description, exactly on a par with the part delineation and dissectional drawing when compared with a full artistic illustration ; neither the diagnosis nor the dissectional drawing, however characteristic, precludes the necessity for a full description, nor for a full artistic illustration where it can be had ; in fact, were it not a serious question of space and cost, amounting often to a positive bar, no natural object could be said to be well and properly described and illustrated without *a diagnosis*, such as that mentioned above, *a full description* embracing an almost photographic accuracy of every part, and (where closely allied forms exist) *a differential description* as well, besides full, and dissectional drawings. Of course the full description would be broken up into ordinal, family, generic, and specific characters, each in their proper place ; the three first only requiring repetition where, in the individual examples, they happened to depart from the strict type.

The introductory pages of the work before us are in English, while the descriptions are in Latin ; and the materials from which Dr. Thorell has drawn them up have been gathered from various collectors and widely distant parts of Europe, including the northern shores of Africa ; which last, under the term "Mediterranean Basin," Dr. Thorell rightly joins to Europe as a single zoological province. 202 species, belonging to 51 genera, distributed among 12 families, are described, 24 of the species being given as new to science ; a large proportion of the remainder, together with four new genera, having been published as new but a short time before, under the title "Diagnoses Aranearum Europæarum aliquot Novarum Scripsit." T. Thorell, in Tijds. voor Entom. Deel. xviii., 1875.

Dr. Thorell states (p. 1) that he follows here, with some slight modifications, the classification proposed in his former work "On European Spiders ;" this mention gives rise to a long foot-note, of two closely-printed pages, in which he examines and criticises M. Eugène Simon's strictures of his system (published in "Aran. Nouv. ou peu Connus du Midi de l'Europe," 2e Mém. ; "Mém. Soc. Roy. de Sciences de Liége," 2e ser. t. v., 1873). It is not necessary to enter here into the merits of this little passage of arms, but we come to the conclusion, on perusing it, that Dr. Thorell is probably right in saying that he "has not been so fortunate as to make himself understood" by M. Simon. At page 7, the latter author's theory respecting the eyes of spiders is discussed in another long foot-note. This theory has already been noticed in these columns (vol. xi., p. 224). Dr. Thorell, while entering fully into the question of the real nature and structure of the eyes of spiders, says, with regard to this theory, that "it is to be wished that M. Simon would somewhat more accurately describe the researches on which his views are founded ; his theory is, in fact, so much the more remarkable, as no previous naturalist who has investigated the finer structure of the eyes of spiders, appears to have been aware of the existence of any distinction between day-eyes and night-eyes." Independently, however, of M. Simon's theory, the question as to the nature of spiders' eyes is a very interesting one ; and very valuable would be those researches which should reveal to us the actual anatomical condition of such eyes as, for instance, the apparently atrophied, and probably useless, ones of the hind-central pair in the genus *Oecobius*, Luc.

A footnote of considerable length is appended to pages 66 and 67 on the venom of various species of the genus *Lathrodectus*, comparing it with the reputed venom of *Galeodes araneoides*, and questioning the correctness of M. Simon's conclusions (Mém. Soc. Roy., Liége, 2 ser. t. v.), that the bite of *Lathrodectus 13-guttatus* is not poisonous. Another point, also of great interest, is noted at p. 65, where Dr. Thorell speaks of traces of segmenta-

tion (somewhat like that of the abdomen of the *Phalangidea*) in the shape of an encircling furrow towards the hinder extremity of the abdomen of some species of *Lathrodectus:* and he refers to the known fact of the segmentation of the abdomen in the *embryo* of spiders (Claparède, "Recherches sur l'Evolution des Araignées"). Still plainer evidences of obsolete segments have been previously noted in *Erigone corrugis*, Cambr. (Proc. Zool. Soc., March 1875, p. 214, Pl. XXIX. Fig. 21), as well as in some other species of the same genus.

Were it not for points thus incidentally raised, and some of which have been above noticed, Dr. Thorell's present work would be of little interest except to the arachnological specialist; by such, however, it will be hailed as an important and valuable addition to the literature upon European spiders; while a more general interest is imparted to it by the topics here commented upon.

It is one of the disadvantages attending the publication of papers on natural history in periodical journals that such papers are more or less inaccessible to those who either do not possess the journal, or who live at a distance from a library containing it; and this disadvantage is heightened when a series of papers, extending, perhaps, over many years, is thus issued, on any one subject. Araneologists are therefore greatly indebted to the editor of Prof. Hentz's writings, for clearing away a disadvantage of this kind, and one which has been much felt for a considerable period.

Prof. Nicolas Marcellus Hentz, a Frenchman by birth, but obliged to fly his native country at the downfall of the first Napoleon, devoted much time and labour in the United States, the land of his adoption, to the study and collecting of spiders. After having published some few short papers upon them, at length, in 1841, he brought together the whole of his notes and drawings, publishing them in a series of papers in the Journal of the Boston Society of Natural History, at intervals from that year to the year 1850. These papers, eight in number, and contained in three vols.—iv., v., and vi.—of the Boston Journal, together with two or three other papers previously published, and an unpublished[1] supplement, have now been collected and given to the public in the present volume.

Considerable difficulties attended the attainment of this result, especially in regard to the plates; the stones from which the lithographic plates were taken having been destroyed and several of the copper plates lost. The science of photography, in the shape of the Albert-type process, has, however, enabled the editor very successfully to overcome this difficulty, and the facsimile plates produced by it are only second to those of the original papers. In order to enable araneologists to refer to and quote the exact page and plate of the original papers, care has been taken to preserve the old pagination by numbers (within brackets) inserted in the text, and to retain the original numbering of the plates alongside of the numbers referring to the present volume. The matter of the supplement has been worked into the different descriptions, wherever it happened to belong, though still kept separate by means of brackets. With this exception, and the addition of some short notes (referring chiefly to the dimensions and the occurrence of the species) by Mr. J. H. Emerton, Hentz's papers are thus now reproduced just as they were originally written and published by himself.

With regard to the subject matter of this volume, the author appears to have relied more upon the accuracy of his drawings (which were fully coloured, and said to be artistic and of great beauty) than to his descriptions for making known the spiders he discovered; his descriptions consequently are very meagre and unsatisfactory, while the engraved plates cannot be considered to do much justice to the original drawings, if the latter were, as above mentioned, artistic and beautiful; the figures in the plates, though neat, being for the most part very flat and inartistic. It is not meant by this that their utility in the determination of the spiders delineated is much, if at all, impaired; on the contrary, it will probably be found for the most part sufficiently easy for collectors to determine their captures by reference to the figures given. Every description is followed by some observations on the habits and economy of the spider, showing that the author's great pleasure was not merely in the collecting and depicting, but also in observing, the objects of his pursuit.

The system of classification adopted by Prof. Hentz is now a matter of quite secondary importance; though some (probably most) of the genera which he characterised as new, will stand; and so perhaps will the greater number of his species. The total number—254—of spiders described and figured must be considered small compared with the wide area over which they were collected; the larger number, however, appear to have been found in North Carolina and Alabama, with some few from Massachussetts and Georgia. A little vigorous collecting in those localities will doubtless soon lead to the identification of most, if not of all, of the spiders contained in Prof. Hentz's papers, and, with even less doubt, will greatly add to their number.

In thus speaking of Hentz's labours as an araneologist in the United States, it must not be forgotten that the late Dr. Abbott left behind him, many years ago, an extensive series of beautiful drawings of Georgian and other North American spiders; all of these were named and shortly described by Baron Walckenaer in vols. i. and ii. of his "Insectes Aptères" (Paris, 1837). The British Museum possesses a set of these drawings, but whether this is the original set from which Walckenaer's descriptions were derived, or whether (as we have understood) his descriptions were made from another set given to him by Dr. Abbott, and now existing in one of the public institutions of Paris, appears to be uncertain. At any rate the set of drawings in the British Museum Library bears every appearance of being an original, even if a duplicate, set; and it would perhaps be feasible, as well as worth while, now to publish these drawings as a whole, with the names and descriptions given by Walckenaer. Such a volume, in conjunction with that formed by Hentz's papers, would represent very nearly all that has been done in the past to North American Araneology, and would form a secure foundation and starting-point for the efforts of the future.

It must not be omitted to mention that the two last

[1] This supplement was published, however, latterly, under the editorial care of Mr. S. H. Scudder, in Proc. Bost. Soc. Nat. Hist., xi., pp. 103—111, Pl. 1, 2, 1867.

plates in the present volume are original ones from the skilful pencil of Mr. J. H. Emerton; these suffer in some measure (as do also some of the others) from their production by the Albert-type process; but in point of accurate detail and artistic finish their figures are immeasurably in advance of those engraved from Hentz's drawings. It is to Mr. Emerton, who appears to have resolutely entered upon the field of araneology, and to his great powers of delineation, that the arachnologists of the Old World now look for the thorough working out and illustration of the Spiders of North America.

O. P. C.

DYEING AND CALICO PRINTING

Dyeing and Calico Printing, including an Account of the Most Recent Improvements in the Manufacture and Use of Aniline Colours. By the late Dr. F. Crace-Calvert, F.R.S., F.C.S. Edited by John Stenhouse, LL.D., F.R.S., &c., and Charles Edward Groves, F.C.S. (Manchester: Palmer and Howe; London: Simpkin, Marshall, and Co., 1876.)

THE subjects treated of in the volume now before us possess a twofold interest—first as involving questions of pure science in the domain of organic chemistry; and secondly, as being of immense industrial importance to the country. It does not enter into our province to notice the work in its industrial aspect, but we have no hesitation in stating that author and editors have performed their task in a highly creditable manner. From every point of view the work will be found useful, and we can recommend it to the scientific chemist as well as to dyers and calico printers.

The author, who died in 1873, had been occupied up to the time of his death in preparing a treatise on colouring matters other than aniline. The present work has been edited from the author's MSS. with the addition of five chapters, forming a considerable portion of the book, on the coal-tar colours, by the editors.

The mode of treatment pursued is nearly the same for each dye. The natural history and source of the material from which the colour is obtained are first given, then the chemical composition and mode of preparation or manufacture, and finally the method of application to the various fabrics described. The whole subject is profusely illustrated by specimens of dyed and printed fabrics pasted into the book.

The work is appropriately prefaced by an obituary notice of the author. The first chapter treats of colour in general and the action of different forces, chemical agents, &c., on the various colouring matters. We must object to the definition of colour given in this chapter. It is defined as "the impression that the light reflected from a surface makes upon the eye," thus excluding all cases in which colour is caused by *absorption*.

Chapters II. and III. are entirely devoted to madder dyes, and contain, among much valuable chemical information, a description of Prof. Stokes's optical tests for alizarin and purpurin. The method of dyeing in Turkey red and the action of different mordants in madder and garancin printing is clearly explained, and the manufacture of artificial alizarin described. Chapter IV. treats of the red dyewoods—logwood, sapan, Lima, peach, and Brazil woods; also of safflower and alkanet. Chapters V. and VI. are devoted to indigo—this portion of the subject being described in considerable detail. Chapter VII. contains accounts of cochineal, kermes, gumlac, lac dye, lac lake, and murexide, while Chapter VIII. treats of orchil, cudbear, and litmus. In Chapter IX. some of the important yellow colouring matters are treated of, such as quercitron, fustic, Persian berries, weld, aloes, turmeric, annatto, &c.; while tannin matters form the subject of Chapter X., the most important of these being sumach and catechu. Chapter XI. contains descriptions of the methods employed for testing and determining the commercial value of particular samples of the various dyestuffs. In this chapter will be found described some of the different forms of "colorometers" which have been devised for estimating the colouring power of dyes.

The portion of the work devoted to the coal-tar colours commencing with Chapter XII. begins with an account of the various bodies which have been found in coal-tar. A list of thirty-eight distinct compounds is given, and many more doubtless exist. The most important substance produced in the dry distillation of coal, so far as the dye manufacturer is concerned, is benzene. The conversion of this substance into aniline is explained, and the manufacture of magenta described, the chapter concluding with an account of safranine and some other aniline reds. Chapter XIII. treats of aniline violets, and blues such as mauve, the Hofmann and methyl-aniline violets, diphenylamine, and Nicholson's blues, &c. In Chapter XIV. we have a description of the greens, aldehyde, iodine, and methyl-aniline and the aniline yellows, phosphine, zinaline, &c. Chapter XV. treats of aniline black and brown, and the concluding chapter is devoted to the phenol, cresol, and naphthalene colours, including picric acid, corallin, aurin, and others. Not the least useful portion of the book will be found the tables at the end, which consist, first of a list of the madder-colouring matters, their formulæ, and reactions, and then a series of tables, which will enable the analyst to distinguish the different colours when fixed on fabrics.

The above imperfect sketch of the present volume will enable our readers to form an idea of the immense number of distinct compounds used in dyeing and calico printing, and the apparently heterogeneous nature of the products, both natural and artificial, called upon to furnish materials for these arts. It must not be forgotten that the enormous development of these industrial arts within the last few years is entirely due to researches undertaken in the first instance without special regard to the commercial aspects of the questions involved—witness the accidental discovery of mauve, the first of the aniline dyes, in the course of an investigation for obtaining quinine by artificial means.

The manufacture of alizarin, the colouring principle of madder, is another triumph of organic chemistry, of which the present generation may justly be proud. It is perhaps not going too far to look for a similar achievement with regard to indigo—in point of fact we may remind our readers that the colour-giving principle of this substance has already been synthesised by the following series of reactions.

A mixture of dried calcium, acetate, and benzoate is